

Rainfall Estimates using NEXRAD Technology

NEXRAD Technology

- The National Weather Service deployed Next Generation Radar (NEXRAD) a.k.a. WSR-88D Weather Radar.
- The technology provides an opportunity to improve the spatial estimation of rainfall amounts.
- NEXRAD sends out a radio signal and measures the signal reflected from falling raindrops (reflectivity).
- NEXRAD uses reflectivity to estimate the amounts of rainfall (using calibrated algorithms).
- It can measure reflectivity out to a distance of 230 km.
- District areal coverage comes from 5 radars (located in Tampa, Melbourne, Jacksonville, Miami, Tallahassee and Key West).
- NEXRAD data are available with 2km x 2km grid resolution every 15 minutes.

Rainfall Estimates

- The estimates are derived by empirical Look-up Table using upper air parameters, reflectivity values and observed rainfall.

NEXRAD Data Acquisition

- The data are currently acquired from Vieux and Associates, Inc. By:
 - South Florida Water Management District
 - St. Johns River Water Management District
 - Suwannee River Water Management District
 - Southwest Florida Water Management District
 - NorthWest Florida Water Management District
- NEXRAD Data Acquisition under St Johns River W.M.D.
- Contract beginning 2002, renewed every 5 years.
- Annual purchase order with One Rain, Inc. from 2002 to 2007.
- Annual purchase order with Vieux and Associates, Inc. from 2007 to current purchase
- NEXRAD data obtained for the following products:
 - Near real-time (NRT) data product for current month
 - End-of-Day (EOD) data product for current month
 - End-of-the-Month (EOM) data product for current month
 - Rain gauge data augmented with radar-based rainfall data (NRG) for current month

NEXRAD Data Characteristic

- 2 km X 2 km grid (= 1 pixel)
- 35 mile boundary buffer around District boundaries

- Base map (in state plane coordinates)
- Total 33,774 pixels (polygons) among them
12,000 pixels within district
- Unique pixel id (8 digit integer e.g., 10074793) based on ArcHydro schema
- Rain gage data are obtained from 75 telemetry stations and 128 CR10 stations.
- NEXRAD Near Real-Time Data Characteristic:
 - Uses only gages over the District
 - Delivery delayed by 5 to 20 minutes
 - Uniform gage adjustment
 - No warping of radar rainfall estimates
 - Does not eliminate bad gage data
 - Might be inconsistent from District to District
- NEXRAD End-of-the-Day/End-of-the-Month Data Characteristic:
 - Use all available rain gages data
 - EOD delivery end of following day
 - EOM and NRG delivery 25th day of the following month
 - Softly warps radar rainfall estimates to match gages
 - Eliminate bad rain gage data
 - Consistent from District to District

NEXRAD Data Types

- Near Real-time (NRT) Data
 - District receives 15-min NEXRAD data every 15-minute interval
 - This data is rain-gage adjusted every 15-minute
- End-of-the Day (EOD) Data
 - District receives 15-min NEXRAD data every 15-minute interval
 - At the end of each day, NRG data is revised for previous every 24 hr period.
 - Perform complex adjustments and QA/QC
- End-of-the-Month (EOM) Data
 - District receives 15-min NEXRAD data every 15-minute interval
 - E O D data is revised with previous months rain gages data
 - Perform complex adjustments and QA/QC
- Rain gauge data augmented with radar-based rainfall data (NRG)
 - District receives 15-min NEXRAD data every 15-minute interval and daily interval
 - Missing or questionable rain gages data is estimated with EOM data.
 - Perform complex adjustments and QA/QC

NEXRAD Rainfall Data Unit

- Inch

NEXRAD Data Retrieval Application

- Access via Corporate Database (DBHYDRO) – only on IWEB for now
- Web enabled application

- Map based and text based application
- Temporal data aggregation (hourly, daily, event, monthly, annual time-frames)
- Spatial data aggregation (rain areas, basins, counties, entire District)
- Data output in both tabular and map image format